



Oregon Perspectives

Ecosystem-Based Management of
Coastal and Ocean Resources

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“Ecosystem management” means

Applying knowledge of ecosystem conditions and functions to adaptive management of resources and uses.

Bailey, 2005

Oregon's coastal management program is embedded in a statewide system of land use planning and management at state and local levels, based on 19 Statewide planning goals:

- | | |
|-----------------------------------|-------------------------------|
| 1. Citizen Involvement | 11. Public Facilities |
| 2. Land Use Planning | 12. Transportation |
| 3. Agricultural Land Protection | 13. Energy Resources |
| 4. Forest Land Protection | 14. Urban Growth |
| 5. Natural Resources, Open Spaces | 15. Willamette River Greenway |
| 6. Air, Water, Land Quality | 16. Estuarine Resources |
| 7. Natural Hazards | 17. Beaches and Dunes |
| 8. Recreation | 18. Coastal Shorelands |
| 9. Economic Development | 19. Ocean Resources |
| 10. Housing | |

Oregon's land use planning program is comprehensive, coordinated, and mandatory. But it is not "ecosystem management."

Bridging from the present to the future

The OCMP is a network of state laws, state and local regulations, and customs that pre-date the concept of “ecosystem management.”

State laws for natural resources are limited in scope and intended to address specific needs, not anticipate complex, ecosystem conditions.

Information required for management has been conceived of as “inventory” information with no functional ecosystem context. Some information is assumed to be available.

Oregon’s “conserve and develop” approach provides the basis for what we now call “ecosystem management.” It is also the basis for what we call “smart growth.”

Political reality dictates that “ecosystem management” will require building on, not replacing, existing regulations and creating collaborative, information-based processes over appropriate spatial and temporal scales.

From 1996 to 2002, the OCMP was an initiator of...and principal partner in...a regional program that previewed a number of aspects of what “ecosystem management” will need to consider in the coastal region of the Pacific Northwest.

Here, briefly, is that story and some lessons learned.

The background image is a photograph of a coastal scene. In the foreground, there is a shallow, calm body of water that reflects the sky and the distant forest. The water has a silty, brownish tint. In the middle ground, a dark, dense line of evergreen trees stretches across the horizon. The sky above is filled with large, white, fluffy clouds. The overall lighting is soft, suggesting an overcast day.

PNCERS

A Case Study for Attempting
Ecosystem-based Management of
Coastal and Ocean Resources

PNCERS



The Pacific Northwest Coastal Ecosystems Regional Study

A Cooperative Program of

- **Oregon Coastal Management Program**
- **Washington Sea Grant Program**
- **National Marine Fisheries Service Northwest Fisheries Science Center**

Funded by NOAA Coastal Ocean Program

PNCERS



Program Framework

- Regional in scale
- Ecosystem in scope
- Interdisciplinary
- Multidisciplinary
- Multi-institutional
- Link natural to social sciences
- Salmon context, not salmon focus

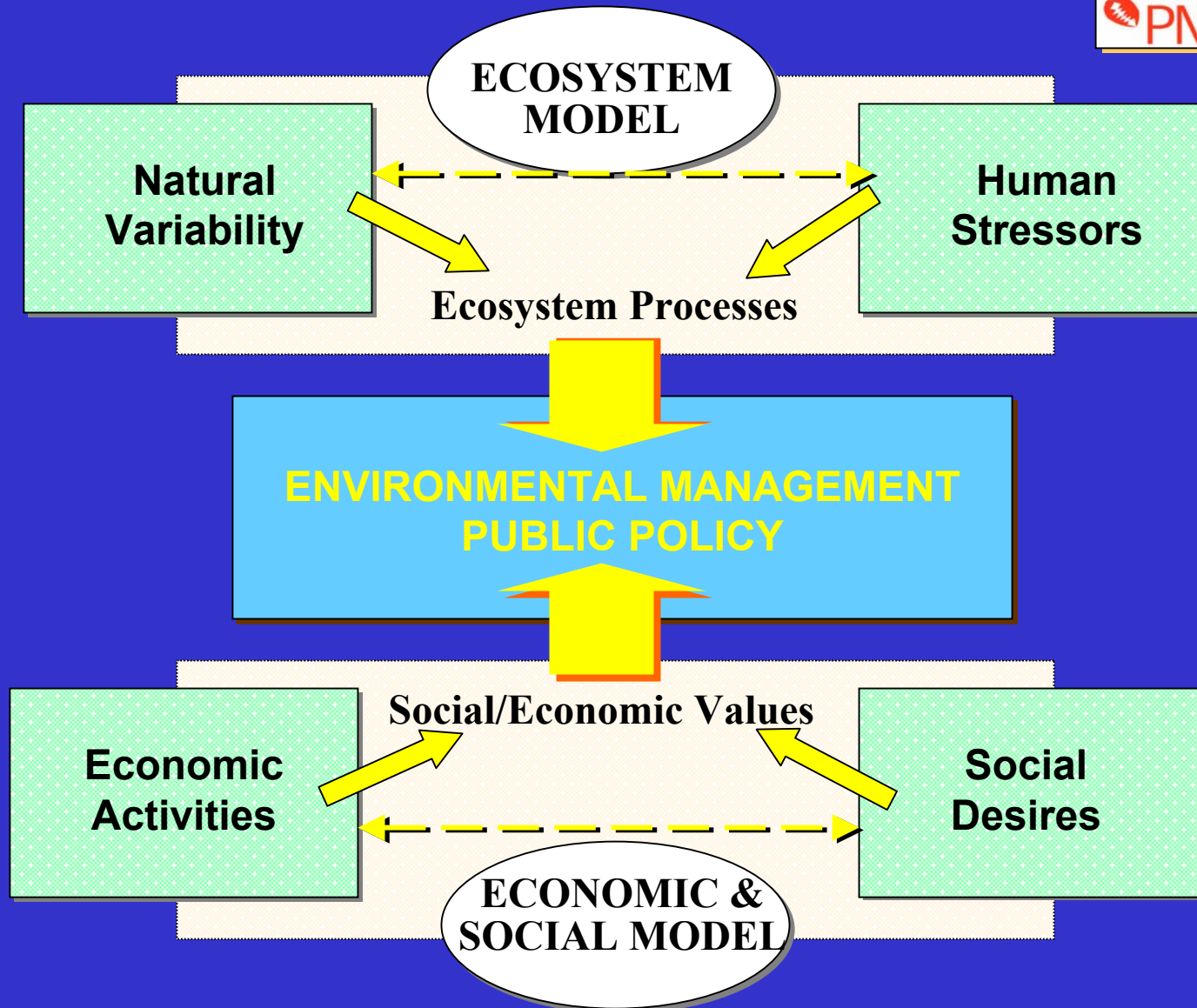
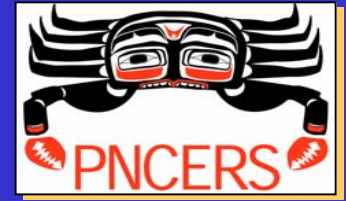
PNCERS



MISSION:

"To improve the understanding of natural variability and anthropogenic stressors on coastal ecosystems that support salmon, and to translate that understanding into improved management of resources and activities that affect coastal ecosystems."

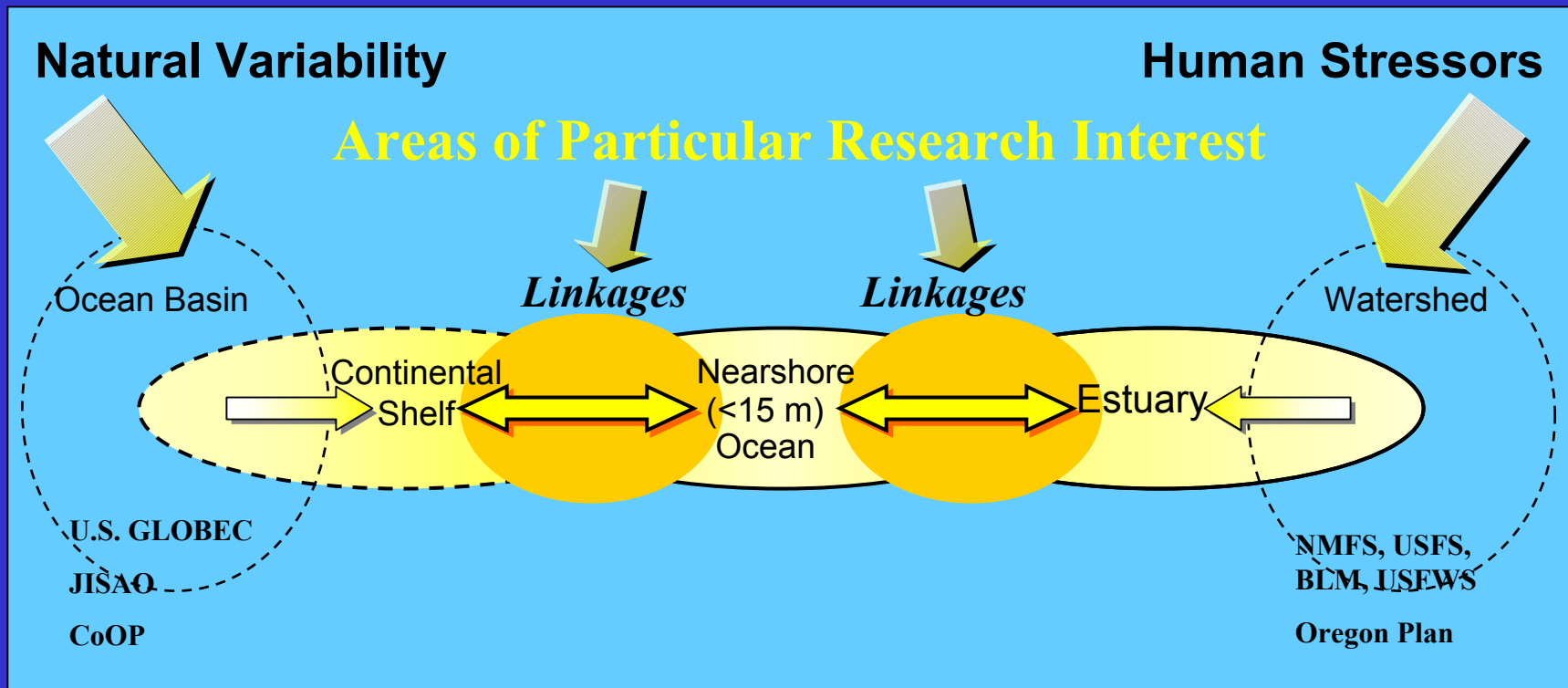
Program Conceptual Model



Applying the Conceptual Model



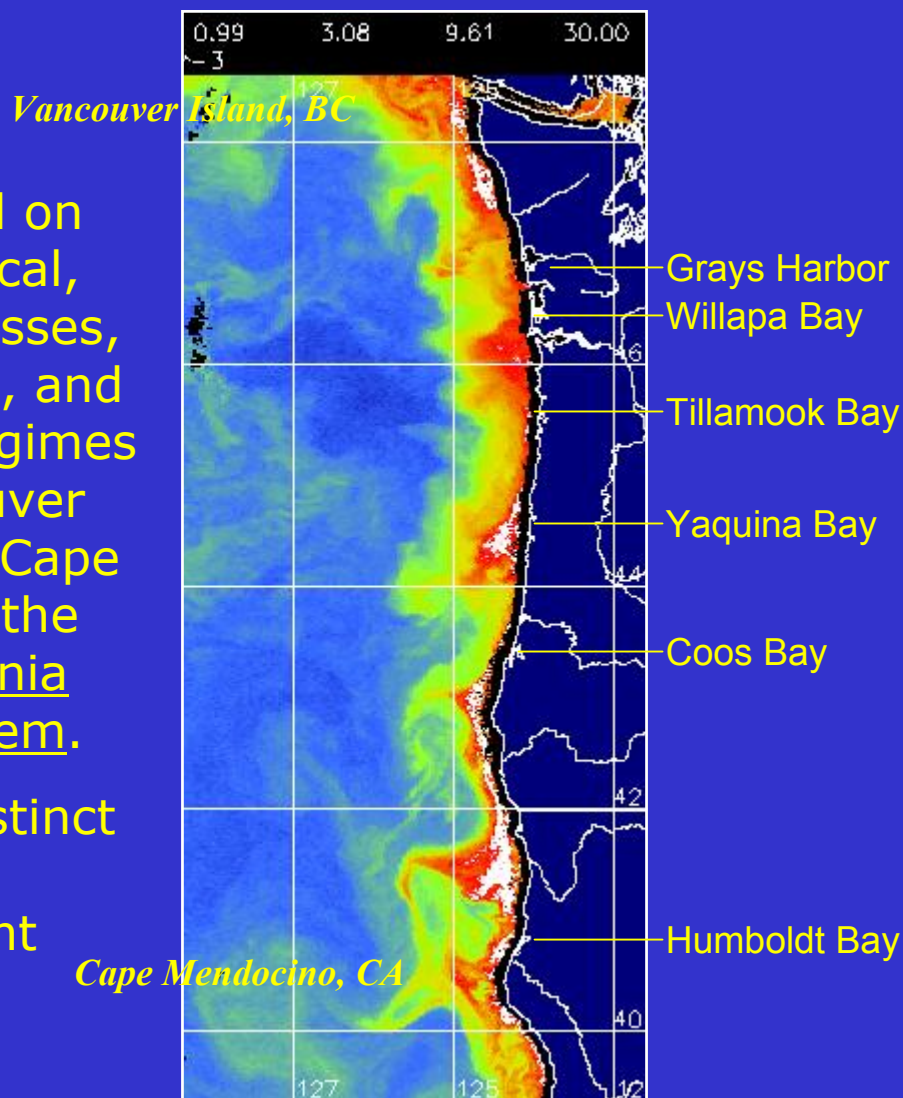
PNCERS focused most research on processes that link major components of coastal ecosystems. PNCERS research was coordinated with other ocean and watershed research programs.



Geographic Scope of Research

PNCERS focused on physical, biological, and social processes, historic changes, and management regimes between Vancouver Island, BC, and Cape Mendocino, CA, the Northern California Current Ecosystem.

This LME is a distinct subset of the California Current Ecosystem.





Program Organization

Program Management Team (OCMP, WSG, NMFS with full-time staff coordinator)

- Research (science team with research coordinator)
- Outreach (PMT)
- Synthesis (science and PMT)

Program oversight: NOAA Coastal Ocean Program

Cost:

\$1.2 mm/year; total of about \$6mm

The research team, selected via RFP,
included Principal Investigators from

- University of Washington
- Oregon State University
- University of Oregon
- Battelle PNW Labs

The annual reports shows the scope of research.

PNCERS

Pacific Northwest Coastal Ecosystems Regional Study

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ANNUAL REPORT

May 2002

PNCERS Projects in Year 4 (2001)

Interactions Between Human Communities and Biophysical Attributes of Pacific Northwest Coastal EcosystemsChapter 1
Jessica Leahy, Daniel D. Huppert, Kathleen Bell, and Rebecca L. Johnson

Oceanography of the Pacific Northwest Coastal Ocean and Estuaries with Application to Coastal EcosystemsChapter 2
Barbara M. Hickey

Evidence for a Regime Shift After the 1997 El Niño, Based on Triennial Acoustic Surveys (1995-2001) in the Pacific Eastern Boundary Current (EBC)Chapter 3
Gordon Swartzman and Barbara Hickey

Ocean Distribution and Estuarine Recruitment of Dungeness Crab Megalopae in Southern WashingtonChapter 4
Curtis Roegner, Alan Shanks, and David Armstrong

Factors Influencing the Spatial and Annual Variability in Eelgrass (*Zostera marina* L.) Meadows in Pacific Northwest, USA, SystemsChapter 5
Ronald Thom, Amy Borde, Steven Rumrill, Dana L. Woodruff, Gregory D. Williams, John Southard, and Susan L. Blanton

Survival Rates of Coho (*Oncorhynchus kisutch*) and Chinook Salmon (*O. shawytscha*) Released from Coastal Washington and Oregon HatcheriesChapter 6
Arni Magnusson and Ray Hilborn

Oyster Yield in Space and Time: Factors Influencing Performance of *Crassostrea gigas* in a Pacific Northwest EstuaryChapter 7
Jennifer R. Ruesink, Curtis Roegner, Brett Dumbauld, and David A. Armstrong

The development and application of a bioenergetics model for juvenile *Cancer magister*: examining the relative contribution of different estuarine habitats to growth of juvenile Dungeness crabChapter 8
Kirstin K. Holsman, David A. Armstrong, David A. Beauchamp, and Jennifer R. Ruesink

Estuarine Production of Juvenile Dungeness Crab (*Cancer magister*) and Contribution to the OR-WA Coastal FisheryChapter 9
David A. Armstrong, Chris Rooper, and Donald R. Gunderson

Use of Estuarine Habitats by Juvenile English Sole (*Pleuronectes vetulus*) in Oregon and Washington Chapter 10
Chris Rooper, Donald R. Gunderson, and David A. Armstrong

Resident Attitudes Regarding the Coastal Environment and Resource ManagementChapter 11
Christopher Farley and Rebecca Johnson

Willingness to Pay for Coho Salmon Enhancement Programs Chapter 12
Daniel Huppert, Jessica Leahy, Kathleen Bell, and Rebecca Johnson

Challenges and Strategies for Better Use of Scientific Information in the Management of Coastal Estuaries Chapter 13
Thomas Leschine, Kathleen Bell, Bridget Ferriss, and Sarah MacWilliams

Other PNCERS Activities:

- Annual workshops with coastal/estuarine practitioners
- Annual program synthesis workshops with investigators, grad students, and partners
- Annual program report with preliminary research results
- Website
- Regional metadata posting
- Print publications: Regional Synthesis document
- Regional Estuary Management overview
- Historical change website

What We Learned

- ✓ Ecosystem science and resource management operate on fundamentally different time and spatial scales.
- ✓ Scientists, managers, and practitioners have different cultures, languages, and standards of accountability.
- ✓ Scientists ask questions, managers want answers.
- ✓ Communication is key: purposeful mechanisms and enduring effort are essential to ensure communication among scientists, managers, practitioners, and stakeholders.
- ✓ Multidisciplinary is easy; interdisciplinary is difficult.
- ✓ Lack of long time-series data and basic field assessments hamper ecosystem research and understanding.
- ✓ At best, ecosystem understanding can offer principles and predictive guidance but not site-specific data for decisions.

What Didn't Work

- Finite program length was artificially short. Continuity is needed to “institutionalize” this approach over time.
- Meaningful synthesis lags research.
- Funding for synthesis was inadequate.
- Research and process studies (monitoring) take more time than anticipated.

Conclusions:

- Ecosystem management can be achieved but will take focused effort, long-term commitment, and political will.
- Ecosystem management will require new money in addition to existing funding, even with re-orientation of programs and efforts.
- Ecosystem management must not be a fad. Turning programs off in three or four years in favor of another approach will be disastrous.
- Ecosystem management requires robust partnerships:
 - States can and must be partners and leaders in this effort. They are the bridge to local communities and stakeholders.
 - Federal agencies and resources will provide the financial and technical backbone.
 - Universities have tremendous research and technical capacity. Sea Grant programs will be a critical partner and liaison.
 - Empowering local practitioners and communities with information is essential to on-the-ground success.

For more information, see

www.pncers.org

